STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33457.1.1	1	13

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33457.1.1 (B-4101) F.A. PROJ. BRSTP-1741(3)

COUNTY DAVIDSON

PROJECT DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741

SITE DESCRIPTION

ID: B-4101

PROJECT: 33457.1.1

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PERSONNEL

LITTLE

MURRAY

ESTEP

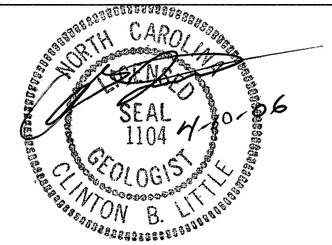
HARPER

INVESTIGATED BY MURRAY

CHECKED BY LITTLE

SUBMITTED BY LITTLE

DATE APRIL 2006



DRAWN BY: LITTLE

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PROJECT REFERENCE NO.	SHEET NO.
B-4101	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX								GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
				35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PLASTIC RANGE (PI): LL — LIQUID LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS
S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RS - ROCK SAMPLE
RT - RECOMPACTED TRIAXIAL SAMPLE
CBR - CALIFORNIA BEARING RATIO SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [X] TRICONE 2⅞" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-4
22+49.93 -L-
14.95' LT. ELEVATION: 783.30 FT.

NOTES:

REVISED 02/23/06

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

April 5, 2006

STATE PROJECT: 33457.1.1 (B-4101)
FEDERAL PROJECT: BRSTP-1741(3)
COUNTY: Davidson

DESCRIPTION: Bridge 141 over Spurgeon Creek on SR 1741

SUBJECT: Geotechnical Report – Bridge Foundation Investigation

The project is located in northeastern Davidson County, west of High Point. This is a bridge replacement project utilizing an on-site detour with a temporary detour structure. The existing roadway (SR 1741 Wallburg-High Point Road) is a well traveled two-lane roadway that runs from High Point to NC 109 at Wallburg. The existing bridge is 3 spans (3@25) built in 1948.

The Geotechnical investigation was conducted in February 2006 utilizing a CME-550 drill with NW casing and 2-7/8" roller cone bit on a casing advancer with water. We conducted four borings for the primary structure. A previous boring performed for a planning document in 2004 is also included.
The bridge crosses Spurgeon Creek. The stream channel is about 30' wide at this point, with a floodplain approximately 400' wide. Depth of water at normal flow (Elevation 768.5) is about 1.5 feet. The 100 yr flood elevation is 780.7'. The roadway elevation is about 785'. Groundwater readings in the open boreholes were near elevation 770 to 775'.

The project area is in the piedmont region on the boundary between the Carolina Slate Belt and the Charlotte Belt. The geology is mapped as metamorphosed granitic rocks. Samples of saprolite obtained indicate a mafic volcanic body intruded by granitic rock with subsequent metamorphism. No rock core samples were obtained. Samples of saprolite and weathered rock were consistent with the mapped units.

Foundation Materials

End Bent One:

Existing roadway fill is present to depths of 10 to 12 feet. It consists of red-brown medium stiff moist sandy clay. Alluvial soils occur below the fill. These soils are very soft and saturated, consisting of clayey silt and silty clay. Along the Detour alignment, the surface alluvial soils would not support the weight of the drill rig. The alluvium rests on a thin veneer of residual sandy soils that grade to weathered rock within one to three feet. The top of weathered rock elevation was 762 on the left and 759 right. The top of hard rock as defined by Standard Penetration Test refusal was 757 (left) and 751 (right). No borings were obtained for the Detour Structure, but very similar conditions are anticipated. Groundwater was measured in the EB1-A borehole at elevation 770, but occurs near the existing ground surface (Elev. 775) to the left, along the Detour alignment.

End Bent Two

The existing embankment is about seven feet high and contains red-brown, medium stiff, sandy clay soils. The alluvium is thinner and stiffer than at EB1. It is thinning to the left and may not be present at the detour structure. The underlying residual soils are much thicker than at EB1, with little or no weathered rock but rather and abrupt transition from dense sandy soil to hard rock. The hard rock line is at elevation 742 (left) and 750 (right). Groundwater was measured near elevation 775. No Detour boring was obtained, but the left side –L- boring (EB2-A) is 30' from the Detour centerline and should provide a reasonable approximation of the subsurface conditions for the Detour structure.

Respectfully submitted,

Clint Little
Project Engineering Geologist

PROJECT REFERENCE NO.	SHEET
	4

SITE PLAN

0 50 100
FEET

-DET- PT 13+66.10

.30

-DET- PC 12+85.30

FIELD

S57°22'34"W
62.99'

9.51'

39.32'
S56°07'34"E

EIP

313.25'
S56°07'35"E

-DET- PT 1

EIP
0.15' EIP
TO R/W

-DET- PC 1

SAMUEL M & LUCY J
HASELL
DB 1384 PG 566
PB 26 PG 92

ISBKD

11"CONC

15"CONC

CONC DK

CONC

S13°06'21"W
20.42'
101.77'
S12°30'33"W
SPURGEON CREEK

6° 41' 54"
+04.65'
32.56'
N

S 54° 09' 50.5" E

EXIST R/W

S 43° 00' 52.5" E

BRICK
COLUMN

INV=788.30

18"CONC

F

PDEA
EBZ-A

T FO

EO

S 61° 17' 09.1" E

SEAT=781.60

-L-

BRDG #142

EBZ-B

S 54° 09' 50.5" E

SEAT=781.9

GUY

20+00

W

F

15"PLA

48"WD RAIL

8"DIP

S03°16'04"E
3.09'
22.21'
S16°15'42"W
69.11' SPURGEON CREEK
S38°04'09"E
204.10'
S14°15'19"E
℄ TS ℄ OF CREEK

S 10° 15' 50.0" E

+00.34
38.66

WATER ELEV=779.75

S B4101-2 12+38.61 PINC =
- POC 17+57.67, 15.97' RT.

-L- PT 21+26.38

-L- PC 25

MAXINE HAYWORTH TEW
DB 616 PG 231
DB 612 PG 613
PB 33 PG 61

DAVID L &
DB 18
PB

-TI- 1

ELEV=
NAIL

117.81'
S11°48'47"E

PROJECT REFERENCE NO.	SHEET NO.
B-4101	5

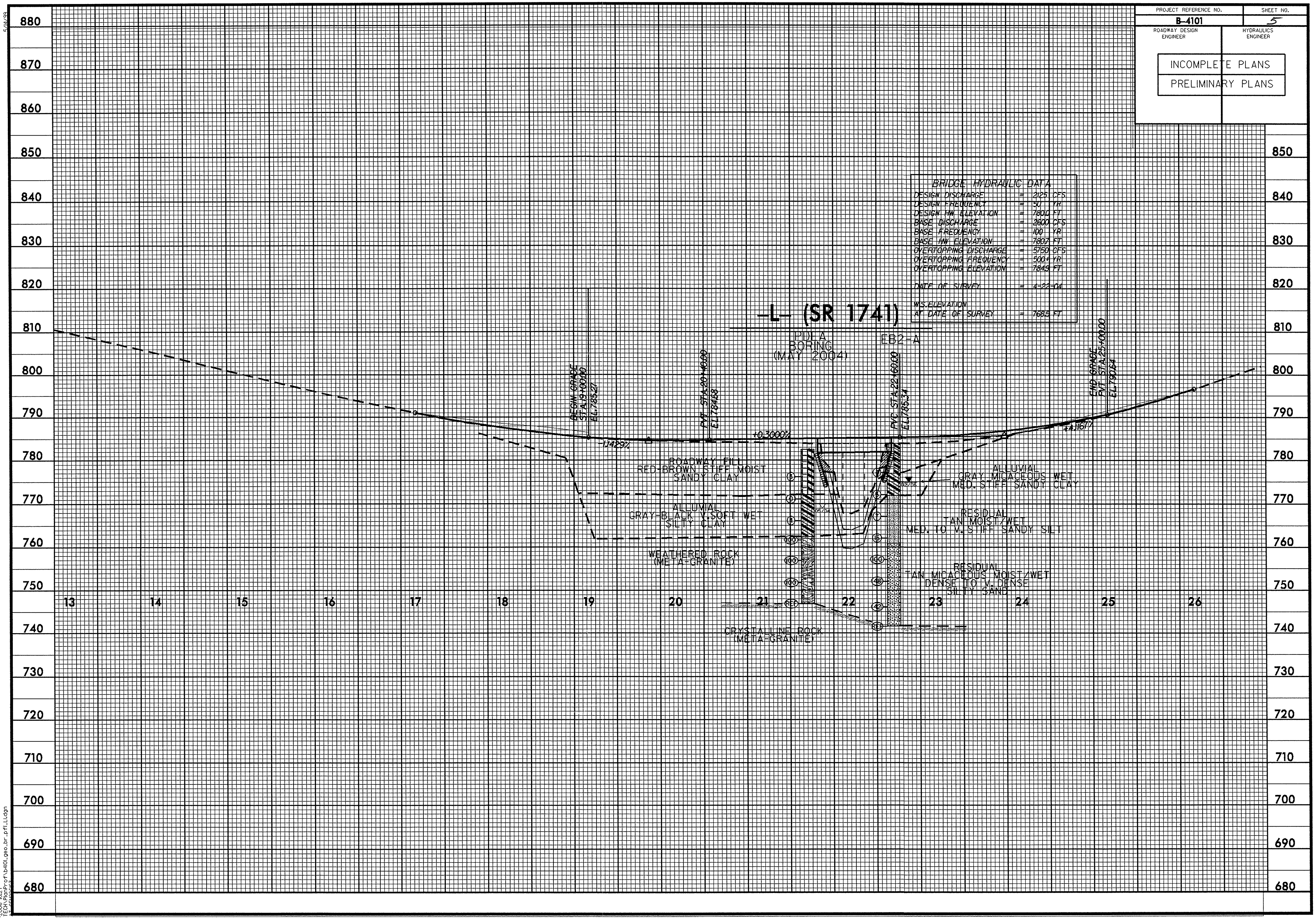
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS

PRELIMINARY PLANS

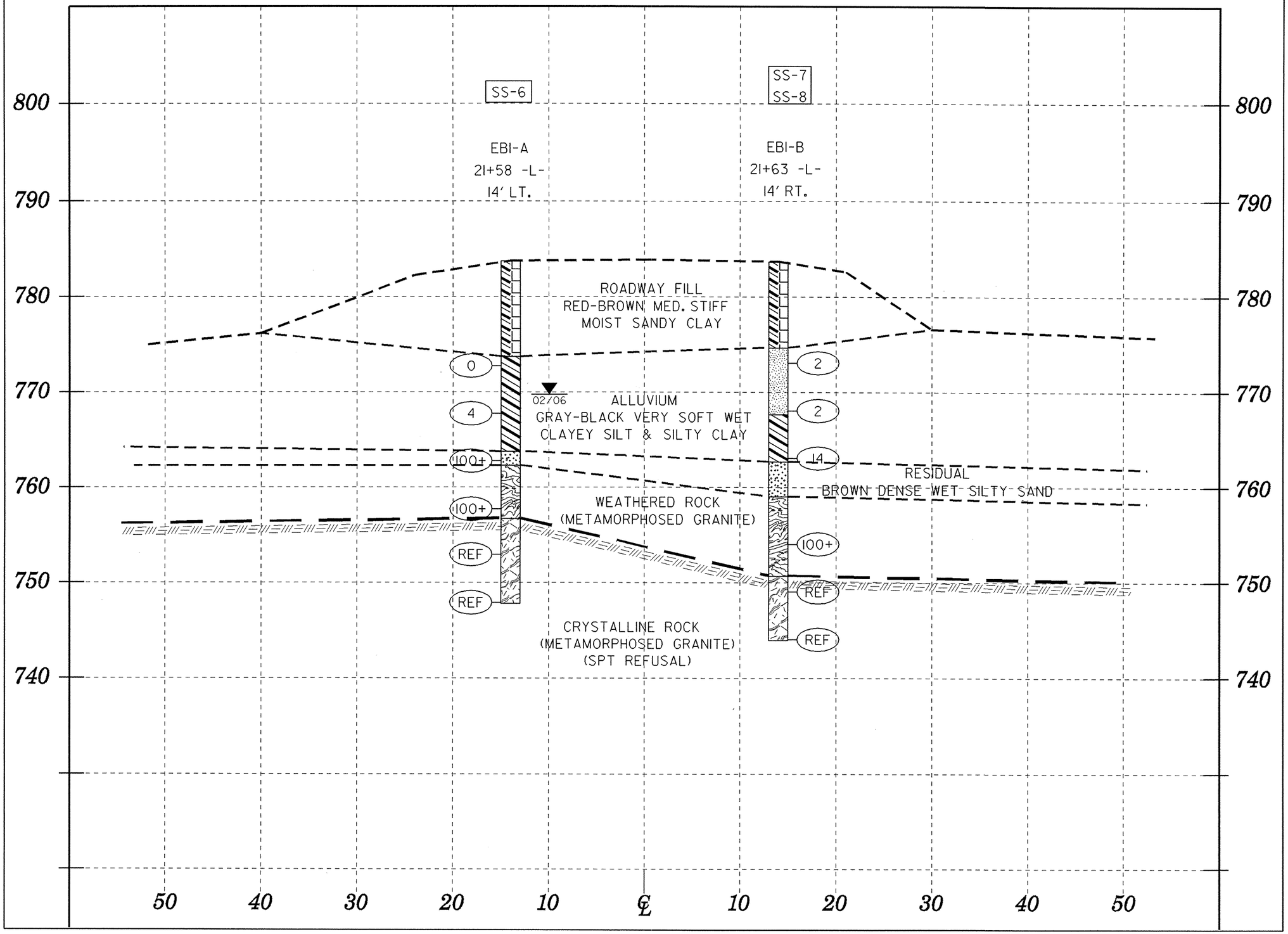
-L- (SR 1741)

BRIDGE HYDRAULIC DATA		
DESIGN DISCHARGE	=	2125 CFS
DESIGN FREQUENCY	=	50 YR
DESIGN HW ELEVATION	=	780.0 FT
BASE DISCHARGE	=	2600 CFS
BASE FREQUENCY	=	100 YR
BASE HW ELEVATION	=	780.7 FT
OVERTOPPING DISCHARGE	=	5750 CFS
OVERTOPPING FREQUENCY	=	500+ YR
OVERTOPPING ELEVATION	=	784.9 FT
DATE OF SURVEY	=	4-22-04
W.S. ELEVATION AT DATE OF SURVEY	=	768.5 FT



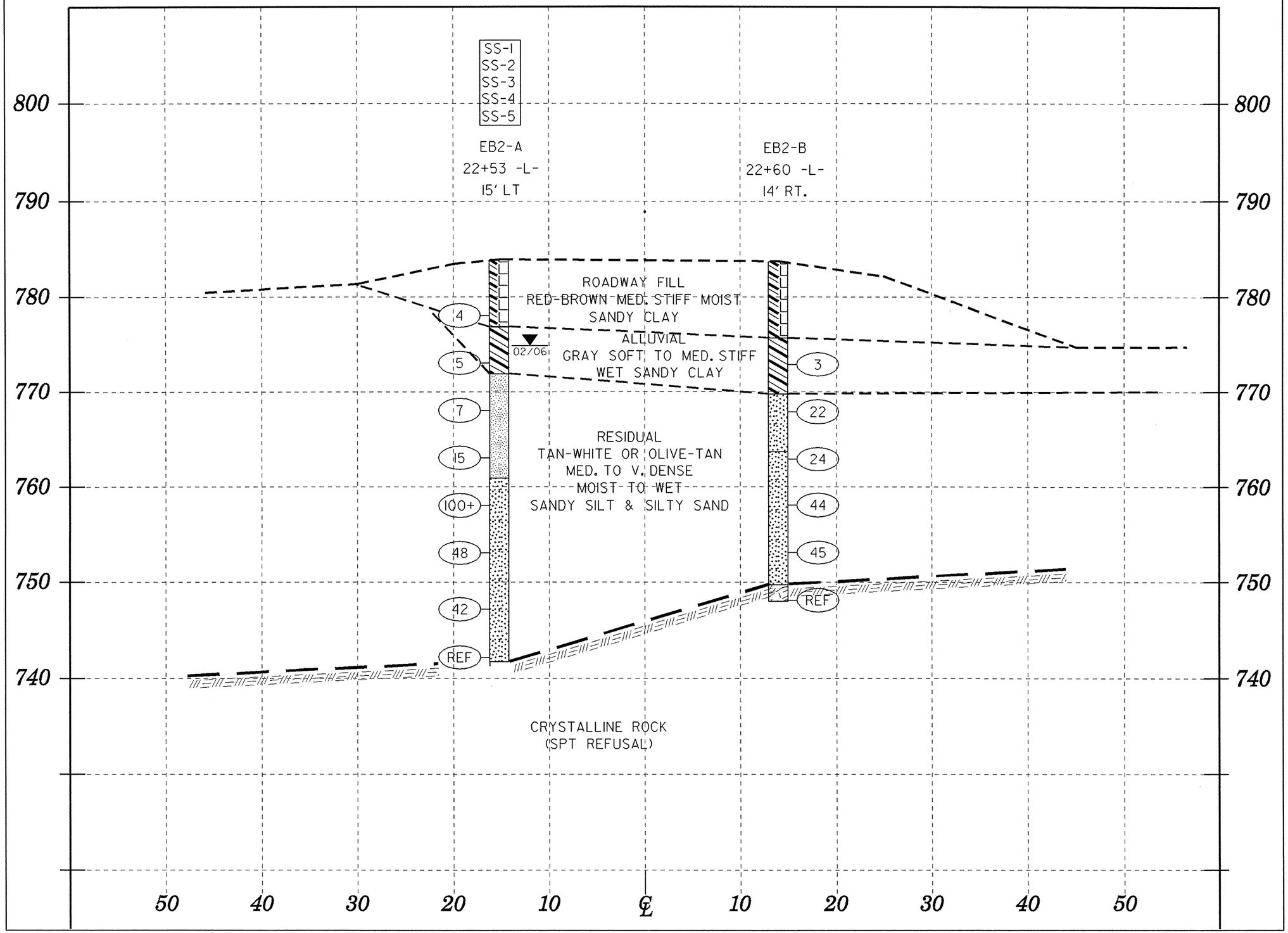
SECTION THROUGH EB1-A & EB1-B

PROJECT B-4101
COUNTY DAVIDSON



SECTION THROUGH EB2–A & EB2–B

PROJECT B–4101
COUNTY DAVIDSON



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33457.1.1	**ID** B-4101	**COUNTY** DAVIDSON	**GEOLOGIST** MURRAY
SITE DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741			**GND WATER**
BORING NO EB1-A	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 21+58.000	**OFFSET** 14.00ft LT	**24 HR** N/A
COLLAR ELEV 783.76ft	**TOTAL DEPTH** 35.90ft	**START DATE** 2/09/06	**COMPLETION DATE** 02/09/06
DRILL MACHINE CME 550	**DRILL METHOD** ROTARY W/O MUD		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB1-A, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
						Ground Surface				
783.76										
780.00								M		ROADWAY FILL RED-BROWN SANDY SILTY CLAY
	11.00	0	0	0	1.0	0	SS-6	W		ALLUVIAL GRAY-BLACK VERY SOFT WET SILTY CLAY
770.00										
	16.00	2	2	2	1.0	4		W		
	21.00	5	80	20	0.6	100		W		RESIDUAL BROWN DENSE WET SILTY SAND
760.00										WEATHERED ROCK (META-GRANITE)
	26.00	14	100		0.5	100				
	30.80	100			0.1	100				MOD. SEVERE WEATHERED META-GRANITE
750.00										
747.86	35.80	100			0.1	100				
						TERMINATED ON ROCK (SPT REFUSAL) AT 35.9'				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33457.1.1	**ID** B-4101	**COUNTY** DAVIDSON	**GEOLOGIST** MURRAY
SITE DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741			**GND WATER**
BORING NO EB1-B	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 21+63.000	**OFFSET** 14.00ft RT	**24 HR** N/A
COLLAR ELEV 783.59ft	**TOTAL DEPTH** 39.70ft	**START DATE** 2/09/06	**COMPLETION DATE** 02/09/06
DRILL MACHINE CME 550	**DRILL METHOD** ROTARY W/O MUD		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB1-B, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
						Ground Surface				
783.59										
780.00								M		ROADWAY FILL RED-BROWN SANDY CLAY
	10.60	0	0	2	1.0	2	SS-7	W		ALLUVIAL GRAY SOFT F. SANDY CLAYEY SILT
770.00										
	15.60	1	1	1	1.0	2	SS-8	W		GRAY SOFT SILTY CLAY
	20.60	3	7	7	1.0	14		W		RESIDUAL TAN-GREEN MICACEOUS SILTY SAND
760.00										WEATHERED ROCK (SEV. WEATH. META-VOLCANICS)
	29.60	31	69		0.8	100				
750.00	34.60	100			0.1	100				CRYSTALLINE ROCK MOD. SEVERE WEATHERED META-VOLCANIC W/ GRANITIC INTRUSIONS
743.89	39.60	100			0.1	100				
						TERMINATED ON GRANITIC ROCK (SPT REFUSAL) AT 39.7'				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33457.1.1	**ID** B-4101	**COUNTY** DAVIDSON	**GEOLOGIST** MURRAY
SITE DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741			**GND WATER**
BORING NO EB2-A	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 22+53.000	**OFFSET** 15.00ft LT	**24 HR** 9.00ft
COLLAR ELEV 783.92ft	**TOTAL DEPTH** 42.20ft	**START DATE** 2/08/06	**COMPLETION DATE** 02/08/06
DRILL MACHINE CME 550	**DRILL METHOD** ROTARY W/O MUD		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB2-A, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
783.92						Ground Surface				
780.00										ROADWAY FILL RED-BROWN SANDY CLAY
	5.80	2	2	2	1.0	4	SS-1	W		
	10.80	0	2	3	1.0	5	SS-2	W		ALLUVIAL GRAY MED. STIFF MICACEOUS SANDY CLAY
770.00										RESIDUAL TAN CLAYEY SANDY SILT
	15.80	2	3	4	1.0	7	SS-3	W		
	20.80	6	7	8	1.0	15	SS-4	W		
760.00										TAN MICACEOUS SILTY SAND
	25.80	37	63		1.0	100				
	30.80	23	27	21	1.0	48	SS-5	M		
750.00										
	36.70	24	21	21	1.0	42				
741.72	41.70	16	100		0.6	100				
						TERMINATED ON CRYSTALLINE ROCK AT 42.2'				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33457.1.1	**ID** B-4101	**COUNTY** DAVIDSON	**GEOLOGIST** MURRAY
SITE DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741			**GND WATER**
BORING NO EB2-B	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 22+60.000	**OFFSET** 14.00ft RT	**24 HR** N/A
COLLAR ELEV 783.74ft	**TOTAL DEPTH** 35.70ft	**START DATE** 2/09/06	**COMPLETION DATE** 02/09/06
DRILL MACHINE CME 550	**DRILL METHOD** ROTARY W/O MUD		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB2-B, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
783.74						Ground Surface				
780.00								M		ROADWAY FILL RED-BROWN SANDY CLAY
	10.80	2	1	2	1.0	3				ALLUVIAL GRAY SOFT CLAYEY SANDY SILT
770.00								W		
	15.80	5	7	15	1.0	22				RESIDUAL TAN-WHITE CLAYEY CSE. SAND
	20.80	9	11	13	1.0	24		W		
760.00										OLIVE-TAN MICACEOUS SILTY SAND
	25.60	8	15	29	1.0	44				
	30.60	29	23	22	1.0	45		M		
750.00										
748.04	35.60	100			0.1	100				CRYSTALLINE ROCK MOD. SEVERE WEATH. META-GRANITE
						TERMINATED ON CRYSTALLINE ROCK (META-GRANITE) AT 35.7'				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33457.1.1	**ID** B-4101	**COUNTY** DAVIDSON	**GEOLOGIST** MURRAY
SITE DESCRIPTION BRIDGE 141 OVER SPURGEON CREEK ON SR 1741			**GND WATER**
BORING NO PDEA	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** 13.60ft
ALIGNMENT L	**BORING LOCATION** 21+53.500	**OFFSET** 17.00ft LT	**24 HR** N/A
COLLAR ELEV 0.00ft	**TOTAL DEPTH** 35.60ft	**START DATE** 5/27/04	**COMPLETION DATE** 05/27/04
DRILL MACHINE CME 550	**DRILL METHOD** ROTARY W/O MUD		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH N/A	**DEPTH TO ROCK** N/A		**Log PDEA, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	▼ MOI	LOG	SOIL AND ROCK DESCRIPTION
0.00						Ground Surface				
	5.40	0	1	2	1.0	3	SS-1	M		ROADWAY FILL RED-GRAY MIC. SANDY SILTY CLAY
-10.00	10.40	0	0	-4	1.0	0	SS-2	W		
	15.40	0	2	2	1.0	4				ALLUVIAL GRAY SILTY SANDY CLAY
-20.00	20.40	100			0.5	100				
	25.40	100			0.3	100				WEATHERED ROCK (SEV. WEATHERED META-GRANITE)
	30.40	100			0.3	100				
-35.60	35.40	100			0.2	100				
						TERMINATED IN WEATHERED ROCK AT 35.6'				

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. B-4101

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project	3345711	**County**	DAVIDSON	**Owner**	
Date: Sampled	2/8/06	**Received**	2/10/06	**Reported**	2/14/2006
Sampled from				**By**	C C MURRAY
Submitted by	N WAINAINA				1995 **Standard Specifications**

728287 TO 728294
3/6/06

TEST RESULTS

Proj. Sample No.		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.		728287	728288	728289	728290	728291	728292
Retained #4 Sieve	%	1	-	-	-	-	-
Passing #10 Sieve	%	95	99	99	99	97	97
Passing #40 Sieve	%	71	87	92	92	81	80
Passing #200 Sieve	%	40	56	46	43	30	55

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	35.3	19.4	17.6	16.3	32.5	23.7
Fine Sand Ret - #270	%	27.4	31.7	46.4	50.7	43.1	23.7
Silt 0.05 - 0.005 mm	%	18.9	28.5	27.9	28.9	20.3	22.0
Clay < 0.005 mm	%	18.4	20.4	8.2	4.1	4.1	30.6
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.	37	38	36	35	31	33
P. I.	13	12	NP	NP	NP	15
AASHTO Classification	A-6(2)	A-6(5)	A-4(0)	A-4(0)	A-2-4(0)	A-6(5)
Station	22+53	22+53	22+53	22+53	22+53	21+58
OFFSET	15 LT	15 LT	15 LT	15 LT	15 LT	14 LT
ALIGNMENT	L	L	L	L	L	L
Depth (Ft)	5.80	10.80	15.80		30.80	11.00
to	7.30	12.30	17.30		32.30	12.50

cc: C C MURRAY
Soils File

Soils Engineer

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. [redacted]

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project	3345711	**County**	DAVIDSON	**Owner**	
Date: Sampled	2/8/06	**Received**	2/10/06	**Reported**	2/14/2006
Sampled from				**By**	C C MURRAY
Submitted by	N WAINAINA				1995 **Standard Specifications**

728287 TO 728294
3/6/06

TEST RESULTS

Proj. Sample No.		SS-7	SS-8				
Lab. Sample No.		728293	728294				
Retained #4 Sieve	%	-	-				
Passing #10 Sieve	%	100	97				
Passing #40 Sieve	%	99	80				
Passing #200 Sieve	%	71	52				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	5.9	25.5				
Fine Sand Ret - #270	%	31.7	25.7				
Silt 0.05 - 0.005 mm	%	35.9	20.1				
Clay < 0.005 mm	%	26.6	28.6				
Passing #40 Sieve	%	-	-				
Passing #200 Sieve	%	-	-				

L. L.	35	33				
P. I.	10	13				
AASHTO Classification	A-4(6)	A-6(4)				
Station	21+63	21+63				
	14 RT	14 RT				
Hole No.	L	L				
Depth (Ft)	10.60	15.60				
to	12.10	17.10				

Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 33457.1.1 TIP: B-4101 COUNTY: DAVIDSON

DESCRIPTION(1):

EXISTING BRIDGE

Information from: Field Inspection X Microfilm ____ (reel ____ pos: ____)
Other (explain) ____

Bridge No.: 141 Length: 75 Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2
Foundation Type: CONCRETE ABUTMENTS, TIMBER PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: EVIDENCE OF PREVIOUS SCOUR AT EB1. HAS BEEN REPAIRED WITH RIP-RAP

Interior Bents: EVIDENCE OF PREVIOUS SCOUR AT BOTH INTERIOR BENTS. RIP-RAP HAS BEEN PLACED.

Channel Bed: NONE

Channel Bank: BANK EROSION AT EB1.

EXISTING SCOUR PROTECTION

Type(3): RIP-RAP

Extent(4): AROUND WING WALLS AND INTERIOR BENTS

Effectiveness(5): FAIR

Obstructions(6): OLD BRIDGE FOUNDATIONS UPSTREAM.

DESIGN INFORMATION

Channel Bed Material(7): THIN DEPOSIT OF SAND OVER RESIDUAL SOILS.

Channel Bank Material(8): SOFT ALLUVIAL CLAY (SS-6)

Channel Bank Cover(9): TREES

Floodplain Width(10): 400'

Floodplain Cover(11): FALLOW CROP FIELDS, LIGHT WOODS, LAWN

Stream is(12): Aggrading ____ Degrading X Static ____

Channel Migration Tendency(13): STREAM IS ACTIVELY ERODING TOWARD END BENT ONE SIDE

Observations and Other Comments: ____

GEOTECHNICALLY ADJUSTED SCOUR ELEVATIONS(14) Feet X Meters ____

SINGLE-SPAN, NO INTERI0R BENTS; NO END BENT IMPACT.

Comparison of GASE to Hydraulics Unit theoretical scour:
100 YEAR THEORETICAL CONTRACTION SCOUR ELEVATION IS 764.
HISTORICAL SCOUR (RECENT ALLUVIAL BOUNDARY) IS 763.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40							
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

Template Revised 08/22/05

Reported by: LITTLE/MURRAY **Date:** 4/10/2006

INSTRUCTIONS

1 Describe the specific site's location, including route number and body of water crossed.
2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
3 Note existing scour protection (e.g. rip rap).
4 Describe extent of existing scour protection.
5 Describe whether or not the scour protection appears to be working.
6 Note obstructions such as dams, fallen trees, debris at bents, etc.
7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
10 Determine the approximate floodplain width from field observation or a topographic map.
11 Describe the material covering the floodplain (e.g. grass, trees, crops).
12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
14 Give the geotechnically adjusted scour elevation (GASE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the GASE. If the GASE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The GASE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

SITE PHOTO B-4101